

REMARKS

Request for reconsideration of the pending application is respectfully requested in view of the following observations on the proposed combination of U.S. patent 6,266,426 (herein referred to as "Azima I") in view of U.S. patent 5,663,894 (herein referred to as "Seth") used to reject pending claims 1-4, 6, 7 and 9-21. It is kindly submitted that Azima I and Seth, whether considered collectively or individually, fail to establish a case of *prima facie* obviousness against the pending claims.

In the subsequent discussion, the following particulars will be explained in reference to pending claim 1 which is considered patentable over the teachings of Azima I and Seth.

First, it will be shown that Azima I does not disclose or suggest the transducer required by pending claim 1, and instead relies on the description of a transducer in U.S. patent 6,151,402 (herein referred to as "Azima II") which teaches a transducer different from the transducer prescribed by pending claim 1.

Second, the transducer referred to in Seth will be shown to be substantially different from the transducer required by claim 1.

Third, one skilled in the art would not be motivated to make the transducer of pending claim 1 in view of Azima I and Seth since these patents do not (a) teach each and every feature required by claim 1, (b) there is no suggestion contained within these patents as to the desirability to combine Azima I and Seth to make the transducer according to claim 1, and (c) there is no reasonable expectation of success that the transducer of claim 1 would result in view of the proposed combination of Azima I and Seth.

Pending claims 2-4, 6, 7 and 9-21 are patentable based on their dependency from claim 1, and their individually recited features. Therefore, these claims will not be addressed in any detail in the following remarks.

1. Azima I does not disclose or suggest the transducer according to pending claim 1

Contrary to the assertion made in the outstanding Office action, and the Office action dated July 21, 2004, the transducer (9) of Azima I does not possess the required structure according to pending claim 1. As was pointed out in the remarks of the last reply dated October 20, 2004, in reply to the Office action dated July 21, 2004, the transducer (9) of Azima I is specifically referred to as having the construction described in related U.S. application 09/011,831, which resulted in Azima II.

It will be noted that Azima I also refers to the transducer of U.S. application 09/011,773 (U.S. patent 6,192,136) and U.S. application 09/110,770. U.S. patent 6,192,136 has a description that is similar to Azima II, and U.S. application 09/110,770 does not appear to have resulted in a patent.

Azima I generically shows transducer (9) basically composed of a disk in the drawings accompanying the patent. It appears from the basis for the rejection of the pending claims that the action treats the generic illustration of the transducer as a disk and alleges that it is a piezoceramic disk of the type required by pending claim 1. The allegation that the transducer of Azima I is a piezoelectric disk is without merit. There is no such specific description of a transducer particularly described in Azima I.

The transducer according to pending claim 1 is not recited generically as the transducer is discussed and shown in Azima I. Instead, pending claim 1 clearly requires that the transducer comprises a one-piece or multi-piece piezoceramic disk that has two radial surfaces and a membrane formed of a material comprising an elastomer.

Upon a casual inspection of the written description of Azima I, the patent identifies the transducer as being of the type specifically drawn from the description

provided in Azima II (col. 2, lines 48-51). This is treated as an incorporation by reference which results in it relying on the teachings of Azima II for the specific configuration of the transducer and attachment of the same onto panel (2).

The description of the transducer of Azima II clearly does not possess the same features as prescribed by pending claim 1. Moreover, the transducer according to Azima I is not connected to a membrane in the manner specifically required by pending claim 1.

The transducer according to Azima II, as illustrated in Figs. 3 and 4, comprises a coil (13) that is rigidly fixed on the outside of a coil former (18) which in turn is rigidly bonded to a surface skin (21) of a radiator panel (2). Unlike the piezoceramic disk according to pending claim 1, the transducer (9) includes a magnetic disk (15) that is enclosed by a pair of poles (14), one of which is close to the interior of the coil former (18) and the other of which is near the peripheral flange (90) surrounding the coil (13) (col. 5, lines 33-40).

The transducer is specifically shown in Figs. 3 and 4 and described in col. 5, lines 41-55 as being mounted to a sound radiating panel (2) with a fastener (93) that extends through the panel. Of particular importance, a spacer (127) is described as being trapped between the transducer (9) and the panel (2). The spacer (127) is specifically indicated as spacing the transducer from the panel. The spacer is also provided to space the pole piece (14) from the panel (2) (col. 2, lines 17-19).

In view of this basic description provided by Azima II and referred to by Azima I as being the transducer for use therein, it is not understood how the action can maintain that the transducer of Azima I is a one-piece piezoelectric disk. There is clearly no such description in Azima I or Azima II. This is a fatal shortcoming that simply has not been addressed and articulated on the record despite applicant's best efforts to evoke a response in the last reply.

As a result of these observations, it is clear that Azima I does not possess the same features of the transducer required by pending claim 1. The coil and magnet assembly of Azima I is simply not the same as a piezoceramic disk of pending claim 1. As a result, Azima I cannot be construed to disclose or suggest a piezoceramic disk that is secured to an elastomeric membrane. It is therefore submitted that one skilled in the art would readily recognize this basic shortcoming of Azima I and simply not be motivated by its teachings to make the piezoceramic based transducer according to pending claim 1.

2. Seth does not disclose or suggest the transducer of pending claim 1 or overcome the shortcomings of Azima I

Seth does not disclose a transducer including a one-piece piezoelectric disk having two radial surfaces and a membrane formed of a material comprising an elastomer which attenuates sound vibrations. Instead, Seth discloses an accelerometer that is attached by means of a hard glue onto a vibrating surface. Hence, Seth does not make up for the basic shortcomings of Azima I.

According to the action, Seth appears to be provided as a teaching in the prior art indicating that it is known to attach a piezoelectric transducer to a vibrating surface with a hard glue. It is submitted that Seth does not teach this important feature according to pending claim 1.

While it is true that Seth describes a mounting method which exhibits relatively good vibrational characteristics by using a hard glue (col. 6, lines 12-15), the sensor for which it refers to is not a piezoceramic disk. The sensor described by Seth is an accelerometer, which is typically of the compression type or the shear type (col. 5, lines 15-17).

The construction of an accelerometer is well-known to those skilled in the art, and is substantially more complex than the transducer according to pending claim 1. In known accelerometer designs, at least those involving piezoelectric elements, an

accelerometer typically includes: a base, a seismic mass which is mounted so as to be able to move relative with respect to the base, and a piezo-element which is mounted between the base and the seismic mass.

In use, the base of such an accelerometer is attached to a surface of a device for which measurements are made. When the device vibrates, the base will also vibrate, while the seismic mass will move relative to the base due to inertial forces. This relative movement of the seismic mass with respect to the base will cause forces to be exerted upon the piezo-element, which in turn generates an electric charge upon deformation.

From the foregoing, it is clear that a sensor, as described by Seth, cannot be precisely compared to a piezoceramic disk, as particularly required by pending claim 1. It follows that Seth does not teach directly attaching a piezoceramic disk having one radial surface onto a membrane with a hard glue. Seth merely describes a method of attaching an accelerometer having a base onto a surface, thereby not providing a solution to the fact that such piezoceramic element is extremely brittle and might break during operation or handling. In fact, Seth teaches the use of mounting studs to mount the accelerometer, and as such, strongly hints that there must be some type of housing protecting any piezoceramic element in the accelerometer.

Unlike the configuration provided by Seth, pending claim 1 requires one of the radial surfaces to be directly attached to the membrane which prevents the breaking of the piezoceramic element during operation or handling. Since it is known that piezoceramic disks are brittle, completely attaching the piezoceramic disk onto a membrane prevents the breaking of the piezoceramic disk during operation.

In view of these observations, it is submitted that Seth does not teach or suggest attaching a piezoceramic disk with one of its radial surfaces directly onto a

membrane in order to flatten the frequency characteristic and to provide sufficient support for the very vulnerable and brittle piezoceramic element.

3. The combination of Azima I and Seth does not amount to a *prima facie* case of obviousness of claim 1

For the foregoing reasons, one skilled in the art would not be motivated to make the transducer of pending claim 1 in view of Azima I and Seth since these patents do not (a) teach each and every feature required by pending claim 1, (b) there is no suggestion as to the desirability within these patents to combine Azima I and Seth to make the transducer according to claim 1, and (c) there is no reasonable expectation of success that the transducer of claim 1 would result in view of the combination of Azima I and Seth.

As detailed in the foregoing discussion, it is readily apparent that Azima I does not disclose or suggest a transducer including piezoceramic disk that is directly attached to a membrane formed of elastic material. Instead, Azima I relies on a transducer having a magnetic disk that is enclosed by a pair of poles, one of which is close to the interior of a coil former and the other of which is near a peripheral flange surrounding a coil. Similarly, Seth also fails to disclose or suggest the piezoceramic disk required by claim 1 since this patent describes an accelerometer having a construction substantially different from the piezoceramic disk prescribed by claim 1 which requires one radial surface of the disk to be directly attached to a membrane.

In view of these observations, it is clear the neither Azima I nor Seth, whether considered collectively or individually, teach each and every feature required by claim 1.

In concert with the shortcomings of the teachings of Azima I and Seth, there is no suggestion as to the desirability of providing a transducer having the construction required by pending claim 1. To the contrary, both of these patents relate and discuss configurations that are different from the transducer of claim 1.

Both Azima I and Seth describe transducers having structural features that are different from and additional to the simple and elegant transducer recited by pending claim 1.

The basis for combining the teachings of Azima I and Seth is based on conclusory statements and convenient assumptions about those skilled in the art. Specifically, it is alleged in the action that one of ordinary skill in the art would be motivated to combine Azima I and Seth to make the transducer of claim 1 on the basis for “rapidly and firmly bond [sic] the piezoelectric driver to the vibrating membrane of the loudspeaker, in order to efficiently and effectively assemble the loudspeaker and for obtaining relatively good vibrational characteristics” as taught by Seth.

The motivation identified in Seth for obtaining the assumption in the action, however, is incomplete. Seth only indicates that the mounting method described therein is provided to obtain “relatively good vibrational” characteristics (col. 6, lines 12-16). Seth says nothing about actually directly attaching a piezoceramic disk to a membrane with a hard glue that will substantially transfer the vibrations of the piezoceramic disk to the membrane. Instead, it is clear from Seth that a piezoelectric element of the accelerometer is not directly attached to a vibrating surface since in the destructive mounting method (col. 6, lines 10-12) it is clear that the accelerometer is attached to the vibrating surface via mounting studs. As such, this confirms that the piezoelectric element of the accelerometer in Seth is in a housing or mounted to a base, and is not directly attached to the vibrating surface.

There is no discussion provided by Seth that would indicate a different configuration of the accelerometer itself for attachment to the vibrating surface with a glue. As is well understood by anyone skilled in the art, a piezoceramic disk is highly brittle, and if a mounting stud were used to mount the disk, it would most likely break. As such, it is clear from Seth that there is no disclosure or suggestion of directly attaching a piezoceramic disk to a membrane with a hard glue.

Azima I does not make up for the shortcomings of Seth since it is clear that Azima I, in light of Azima II, makes no reference to directly attaching a piezoceramic disk onto a membrane with a hard glue. The transducer simply has features which are substantially different from those of the transducer of claim 1. Moreover, Azima I, through Azima II, does not envision mounting the transducer directly to the panel, and instead opts for using a spacer. There is no other description in Azima I that would suggest mounting the transducer to the panel in any other manner.

There is simply no desirability to modify the transducer of Azima I in the manner prescribed in claim 1 to directly attach it to a membrane according to the motivation that is alleged that Seth contains. Such a reconfiguration of the transducer and panel of Azima I would run contrary to the basic teachings of Azima I since the transducer described therein is mounted to the panel with a fastener and spaced a distance from the panel with a spacer. As noted previously, the spacer is provided for spacing the pole pieces from the panel.

The fact that Azima I teaches spacing the transducer from the panel suggests the undesirability of directly attaching a transducer to a panel. Of course, since Azima I teaches the use of a magnetic transducer, this is considered a necessary expedient as opposed to if it actually taught the use of a transducer comprising a piezoceramic disk, as erroneously asserted in the action.

Since Azima I does not describe a transducer having the piezoceramic disk required in pending claim 1, it is submitted that a skilled artisan would not have any reasonable success at making the transducer according to pending claim 1 in view of Seth. One would only result in the magnetic disk transducer of Azima I mounted on the sound radiating panel of Azima I with a hard glue. Of course, there would be a conflict since there is no teaching that indicates the desirability of removing the spacer in the transducer of Azima I. In fact, Azima I, through Azima II strongly

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hints that such a spacer is necessary to prevent interference of one of the poles of the transducer.

It is thus submitted that the proposed combination of Azima I and Seth would not result in the transducer required by pending claim 1. Instead, even with substantial reconfiguration and reconstruction of the teachings of Azima I and Seth, one of ordinary skill in the art would not result with the transducer of pending claim 1, and any such combination of the teachings of Azima I and Seth would result in a non-operable transducer due to the conflict in teachings.

As a result, it is kindly asserted that the proposed combination of Azima I and Seth does not result in a case of *prima facie* obviousness of the transducer of pending claim 1. Therefore, withdrawal of this rejection is respectfully requested.

In light of the observations on the cited prior art, it is respectfully submitted that the application is in condition for allowance. Accordingly, it is respectfully requested that each and every pending claim in the present application be allowed and the application be passed to issue.

If any issues remain that may be resolved by a telephone or facsimile communication with the applicant's attorney, the examiner is invited to contact the undersigned at the numbers shown below.

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Respectfully submitted,



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